I think if Mr. Lewes will turn to the preface to the first edition of the "Critick," he will see that the transcendental logic only (and perhaps I might limit it to the transcendental dialectic) grapples *directly* with the problem indicated by the title of the book. The Æsthetic is a preliminary inquiry, which proves afterwards of great use; but is not to be considered as a Critick of Pure Reason in this particular department. His using the term "concept" of space, is certainly confusing; but its explanation, I think, is to be found in a passage in the "Transcendental Exposition" of this "concept" (Meiklejohn, p. 25), where he says, "It must be *originally* intuition, for from a *mere* conception no propositions can be deducted which go out beyond the conception and this happens in geometry." In the preceding page he similarly qualifies his statement that Space is an intuition. "No conception *as such*," he says, "can be so conceived as if it contained, within itself, an infinite multitude of representations." We may *now* have a concept as well as an intuition of Space and Time; but the intuition was the original form of the idea and it is to the intuition that we must always have recourse in mathematics when we wish to discover a new truth.

I think, if Mr. Lewes will again read over the Transcendental Æsthetic and the parts of the Transcendental Analytic which are closely related to it, he will see that Kant never designates the *original* representations of space and time "concepts," or refers their origin to "pure reason." W. H. STANLEY MONCK

Trinity College, Dublin, Jan. 29

[This correspondence must now cease.—ED.]

NOTES

THE Gold Medal of the Royal Astronomical Society will be presented to M. Delaunay, the president of the Paris Academy of Sciences, to-morrow. It is to be regretted that the stay of the distinguished French savant in England is but short.

WE referred last week to the "situation" at the Paris Observatory. The action of the French Government has been of the promptest and M. Le Verrier is no longer Director. This step indicates very clearly—too clearly we fear—the strength of the case put before the Minister of Public Instruction, in the memorial, of which a copy has been sent to us. This document, which is signed by all the *chefs de service*—Villarceau, Marié-Davy, Wolf, and Loewy—and the *astronomes adjoints* without exception, discusses all points connected with the administration of the Observatory, scientific and otherwise. It is to be sincerely hoped that M. Le Verrier may be able yet to do service to astronomy, in some other capacity, some position where his great talents alone will be called into play. His is a name that will never die, let us hope it is but momentarily eclipsed.

THE Trustees of the Johnson Memorial Prize for the encouragement of the study of astronomy and meteorology propose "the laws of wind" as the subject for the next essay:—1. With regard to storms; 2. With regard to average periodical phenomena at given places on the earth's surface. The prize is open to all members of the University of Oxford and consists of a gold medal of the value of ten guineas, together with so much of the dividends, for four years, on 338*l.* Reduced Annuities as shall remain after the cost of the medal and other expenses have been defrayed. Candidates are to send their essays to the registrar of the university under a sealed cover, marked "Johnson Memorial Prize Essay," on or before the 31st day of March, 1871, each candidate concealing his name, distinguishing his essay by a motto and sending at the same time his name, sealed up under another cover, with the same motto written upon it. No essay will be received after the 31st day of March, 1871.

A NEW office has been constituted under the Public Works Department and Mr. Douglas Galton, C.B., F.R.S., has been appointed to it with the title of Director of Works and Buildings. We may congratulate ourselves that our public building will be looked after by one so eminently qualified by his high scientific attainments and great experience in such matters.

AT the meeting of the French Academy on January 31, the two candidates recommended for the vacancy in the Bureau des Longitudes were M. de la Roche-Poncié and M. Gaussin. The former received 40 votes out of 43. At the same meeting the mineralogical section presented a list of candidates for the vacancy in the list of correspondents to replace Sir Roderick Murchison, who has recently been nominated a foreign associate. The candidates were, in the first rank, Prof. C. F. Naumann; in the second, in alphabetical order, MM. Abich, Gustav Bischoff, Ami Boué, Dana, von Dechen, Domeyko, James Hall, von Hauer, von Helmersen, C. T. Jackson, Kjerulf, von Kokscharow, W. E. Logan, W. H. Miller, Ferdinand Römer, Scacchi, A. Sismonda, and Studer.

THE *Goloss*, of St. Petersburg, says that a special commission will shortly be appointed by the Academy of Sciences there, for the purpose of observing the transit of Venus on the 26th of November, 1874 (old style). The members of the commission are to be Messrs. Struve, Savitch and Wild, of the Russian Academy; Messrs. Döllen and Wagner, superintendents of the Observatory at Pulkova; Vice-Admiral S. J. Seleny and Major-General Forsch. The *Goloss* adds that the reason the commission will be appointed so early, is that much time will be required for making the necessary preparations and that similar commissions have been already appointed in England, France and Germany.

PROF. W. H. FLOWER, who has recently been appointed Hunterian Professor of Comparative Anatomy and Physiology, will commence a course of eighteen lectures introductory to the study of the anatomy of the class Mammalia, on Monday, February 14, 1870, in the Theatre of the Royal College of Surgeons. The lectures are to be delivered on succeeding Mondays, Wednesdays and Fridays, at four o'clock and will treat of methods and aims in the study of morphology: classification of the mammalia; osseous system of the mammalia: Axial skeleton—vertebral column; modifications of the characters of the vertebræ in the cervical, thoracic, lumbar, sacral and caudal regions in different mammals; sternum, cranium, hyoid arch. Appendicular skeleton—essential structure and modifications of the bones composing the shoulder-girdle and anterior extremity; structure and modifications of the pelvic girdle and posterior extremity; comparison between the structure and the functions of the anterior and the posterior extremities. Tegumentary system and its appendages: the dermis; modifications of the integument mainly due to peculiar conditions of the dermis; ossifications in the integument; the epidermis and its modifications; callosities, scales, nails, claws, hoofs, horns, hairs, spines, antlers, glandular organs connected with the integument, or opening on the external surface of the body; scent glands; mammary glands. Dental system: structure and essential characters of teeth; classification and nomenclature of teeth; development and succession of teeth; modifications of the characters of the teeth in the different groups of the Mammalia; horny structures taking the place of teeth in certain mammals. Baleen, &c. These lectures are open to Fellows and Members of the College of Surgeons and of learned and scientific bodies in the United Kingdom.

THE death is announced of E. W. Brayley, many years connected with the London Institution, and a frequent lecturer on scientific subjects. Mr. Brayley was well known for his scientific attainments and has contributed to scientific literature, some valuable papers on geology, astronomy and other subjects.

THE second course of Cantor Lectures for the present Session will be given by Dr. Benjamin Paul, F.C.S. The course will consist of four lectures, "On the Phenomena of Combustion and the Chemical and Physical Principles involved in the Use of Fuel and in the Production of Artificial Light," to be delivered on Monday evenings, the 7th, 14th, 21st, and 28th of March, at 8 o'clock.

The third part of the nineteenth volume of the *Jahrbuch der kais.-kön. geologischen Reichsanstalt*, including the more important papers communicated to the Austrian Geological Institute during the months of July, August, and September, 1869, has just reached us. It contains some valuable memoirs for the students of general geology. M. D. Stur describes the characters and mode of occurrence of the brown-coal in the district of Budafa, in Hungary. He has ascertained the existence of two layers of useful coal, the upper one varying from two to three feet in thickness, the second being usually from four to six feet and sometimes as much as eleven feet thick. Borings indicate a third horizon having coal from eight-and-a-half to ten feet thick; but the quality of this coal has not been ascertained. Dr. M. Neumayr's contributions to the knowledge of the fossil fauna of the Austrian dominions consist of lists and numerous descriptions of fossil shells, from the late Tertiary freshwater marl of Dalmatia and from the Congerian beds of Croatia and West Sclavonia. This paper is illustrated with four plates. M. D. Stur reports upon the geological survey of the environs of Schmöllnitz and Göllnitz, in Hungary, including especially the mountain-mosses of the Volovee and Branisko. It includes an "Eozoonal" rock and deposits belonging to the Carboniferous, Permian, Triassic and Liassic formations. The other papers are: A description of the Amphibole-Trachyte of the Mátra in Central Hungary, by Dr. Joseph Szabó; an account of mineralogical investigations in the chemical laboratory of the Institute, communicated by Karl Ritter von Hauer and a translation, by Dr. E. Bunzel, of the account given by Drs. Carpenter and Wyville Thomson of their dredging operations on board the *Lightning*, in 1868.

The *Canadian Entomologist* for January announces that the Council of the Agricultural and Arts Association of Ontario has appropriated the sum of four hundred dollars to aid the Entomological Society during the present year in forming a cabinet of insects useful or prejudicial to agriculture and horticulture, for continuing the journal and making an annual report. It contains also notes on some of the common species of *Carabidæ* found in temperate North America, by P. S. Sprague; on the currant worm, by W. Saunders; remarks on the history and architecture of wood paper-making wasps, by W. Cowper; a list of *Coleoptera* taken at Grimsby, Ont., by J. Pettit and miscellaneous notes.

The Nederlandsche Maatschappij ter bevordering van Nijverheid—that is, The Netherlands Society for the Promotion of Industry—offer, for the year 1871, a prize of a gold medal worth 150 florins and three hundred florins in money, for the best method of illuminating floating buoys so that they can be seen at night. The contrivance, whatever its form, is to be self-lighting, for obvious reasons. Here, then, is another task for those who are skilful in sending sparks through long wires. We remember that Mr. Siemens had some project of the sort a year or two ago. Is this a fitting opportunity for trying to work it out? If Dutch mariners feel it desirable that their buoys should be lighted at night, so do those of all other nations. Competitors for the prize are to send their documents and models to the general secretary of the society, M. F. W. Van Eeden, at Haarlem, before September 30, 1871.

We learn from the *Athenæum* that Dr. Andrews, Vice Principal of Queen's College, Belfast, has been elected an Honorary Fellow of the Royal Society of Edinburgh, in the room of the late Master of the Mint.

A controversy is going on in the *Medical Times and Gazette* as to the sufficiency of a test for Morphia, involving serious considerations as regards toxicological inquiries. The point is, whether the production of a blueish purple tint on mixing a substance with a molybdate and sulphuric acid, is sufficient proof of the presence of morphia, or whether the same colours may not be produced by other substances which are quite innocuous.

News has this week been received from Mr. C. F. Tyrwhitt Drake of Trinity College, to whom, last autumn, the University of Cambridge granted a sum of money out of the Worts Travelling Bachelors' Fund, to enable him to collect zoological specimens while accompanying Mr. E. W. Palmer of St. John's College, the distinguished orientalist, in exploring the Tîh country—the "Wilderness of the Wanderings." The Arabs were by no means prepared to find Englishmen travelling without the luxuries to which they are accustomed and, in consequence, were suspicious of their object in visiting the country. It is to be hoped, however, that nothing will hinder our adventurous explorers from accomplishing their wish of reaching the Jordan by the route traditionally followed by the Israelites. Mr. Drake's journal and collections can scarcely fail to be of much interest.

We understand that one of the two zenith sectors, constructed by Messrs. Troughton and Simms from the designs of Lieut.-Col. Strange, for the Great Trigonometrical Survey of India, has reached its destination—Bangalore, in the Madras Presidency. This instrument differs entirely from all of its class. Ramsden's and Graham's cumbrous though most ingenious structures of timber were superseded by the far more efficient sector designed some years ago for the Ordnance Survey by the Astronomer Royal. But even Airy's zenith sector was too heavy for transit over the rugged and pathless mountain chains of Hindustan. It weighed, without its packing-cases, upwards of 1,100 lbs. The instrument of which we now speak has been reduced to 600 lbs., without loss of power. The telescope has an aperture of 4 inches with a focal length of 4 feet and the sectors are portions of a circle 3 feet in diameter, read by means of 4 micrometer microscopes. This class of instrument is intended solely for the determination of latitude. Hitherto it has been used for this purpose, in measuring the zenith distances of known stars, as its name implies, which we may call the absolute method. But of late years another mode of determining latitude has come much into favour,—this we will call the differential method. It consists in measuring, with a micrometer attached to the eye-end of the telescope, the difference of zenith distance of two stars nearly equidistant from the zenith, one north, the other south. Its merit consists chiefly in the simplicity of the means necessary for the purpose, namely, a telescope firmly mounted with a good micrometer and a good level, no circle or sector being required. Colonel Strange has, we hear, adapted his instrument to both methods, which may therefore be thus submitted to a comparative trial under circumstances equally fair to each. The instrument is in the hands of Capt. J. Herschel, R.E., who is about to employ it for the twofold purpose of furnishing data for improving our knowledge of the figure of the Earth and of throwing light on the interesting physical problem of local attraction. It will be remembered that some years ago the operations of the Russian Survey indicated the presence, in a particular locality, of a huge subterranean cavity, the existence of which would never have been suspected, had not anomalies in observed latitudes established the fact. We may expect to hear of similar phenomena being discovered by the same means in India when observations are multiplied by a more portable instrument than any hitherto used of equal power. The facts that cavities may exist where least suspected and that hidden masses of higher specific gravity than the surrounding rocks are known to occur, render it imperative that in geodetic operations the latitude, which is affected by such irregularities, should be more frequently observed than was formerly thought necessary. It is satisfactory to find that such scientific desiderata are appreciated and so liberally provided for, by the Indian Administration.

THE purity of the metropolitan water supply has been seriously affected by the winter floods. Professor Frankland, in his last monthly report, states that the water supplied by the East London Company was very turbid and contained vibrios. This is the first occasion in which Dr. Frankland has detected these organisms, which are abundant in putrid sewage, in the London water.

A VERY interesting paper on the Pearl, Coral and Amber Fisheries, was read at the meeting of the Society of Arts held on the 19th inst. The chair was occupied by Professor Owen, who in proposing a vote of thanks to the lecturer, Mr. T. L. Simmonds, made some instructive remarks on the origin of pearl, coral and amber. Both the paper of Mr. Simmonds and the observations of Professor Owen, will be found at full length in the last number of the Society's Journal.

WE are glad to know that an "Athenæum" has been established in Belfast. It contains a large reading-room, provided with most of the daily and weekly papers and the monthly and quarterly reviews. There is also a commercial, literary and scientific reference library and all the usual accessories of a club. Such an undertaking deserves every support. A series of lectures on scientific and literary subjects has already been commenced in connection with this institution.

THE Lowndean Professor of Astronomy in the University of Cambridge intends to give a course of lectures on the Lunar Theory, with special reference to M. Delaunay's method of treating the subject.

Land and Water announces that the Prince Pless, who has large possessions in Siberia, has succeeded in crossing the common Red Deer with the Wapiti (*Cervus Canadensis*) and the perfect fecundity of the hybrids appears to be well established.

ACCORDING to *Les Mondes*, the Mont Cenis tunnel will certainly be finished during the present year. On the 1st ult., the galleries opened measured 10,598 metres and there only remained 1,621 metres to be excavated.

THE *Photographic News* announces that a Photographic Society has just been formed at Dresden. Among the members are the names of Krone, president, Hahn, Hanfstængl, &c. The society publishes a monthly journal entitled *Helios*, this being the sixth photographic journal published in Germany.

Is Sicily about to lose the monopoly of sulphur which she has so long enjoyed? By recent intelligence from America, we learn that a bed of pure sulphur, 135 feet in thickness and about 530 feet below the surface, has been discovered on an island in Bayou Choupique, in the delta of the Mississippi. The place is within ten miles of the sea, from which it may be anticipated that shipment of the mineral will be comparatively easy. The extent of the deposit has not yet been ascertained; but the local formations are such as to lead to the inference that it is "immense." Besides the sulphur, there is a deposit of gypsum, of perhaps equal extent; hence we may anticipate that the company formed to work the one, will also turn the other to profit. Sulphur is so much in demand for the manufacture of sulphuric acid and for many other purposes in the arts, that this discovery of a deposit in a country teeming with energy and enterprise, seems opportune. When in full work it will most likely occasion a fall in the price of sulphur and a corresponding falling off in the use of pyrites. This sulphur bed was discovered during the sinking of a well in search for petroleum. But instead of "oil" the boring discharges a copious stream of water, which is described as a saturated solution of sulphuretted hydrogen, combined with a small amount of gypsum and common salt. It is clear that the company which is about to explore the sulphur, will have to provide for an abundant drainage, as well as for ventilation. The locality may be found on a good map, near Lake Calcasieu, on the western border of the Mississippi delta.

SCIENTIFIC SERIALS

THE new number of Pflüger's Archiv. (III. i.) contains a paper by Prof. L. Hermann "On the absence of currents in uninjured inactive muscle." Munk's views are criticised and a new experiment described, in which the gastrocnemius of a frog is prepared for investigation, in such a way that no contact between the cutaneous secretion and the surface of the muscle (a source of currents in previous observations) takes place. With a galvanometer of 1,600 windings, giving a deviation of 300 sc. for an ordinary nerve current, the muscle so prepared gave only a deviation of 10 to 20 sc. "We are hereby justified," says the author, "in supposing that with a still more careful method of preparation, by the avoidance of yet other unknown causes of injury, we shall at last get a muscle *perfectly* free from currents."

In another paper "On the course of the development of currents in dying muscle," Prof. Hermann shows that when part of a muscle is killed and rendered rigid by exposure to a temperature of 40° C., the development of the current takes place just at the moment when *rigor mortis* makes its appearance.

The same author has also a paper "On the danger of drinking cold water when the body is heated," in which an attempt is made to submit the matter to an experimental inquiry. The only result obtained, however, was that in curarized animals, the injection of ice-cold water into the stomach caused a sudden and great rise in the arterial tension in the carotid and crural arteries, apparently from spasm of the visceral arteries in the neighbourhood of the stomach. Such a sudden increase of tension would prove dangerous in the case of unsound vessels. When the animals, however, were not curarized, very little rise of tension was observed, suggesting the idea that some compensating mechanism was at work, *e.g.* respiratory movements.

There are also papers "On acute phosphorous poisoning," "On convulsions due to disturbances of the cerebal circulation (venous obstruction)" and "On simultaneous contrasts" by Prof. Hermann and his pupils; "On the action of Hydrocyanic acid on the red blood corpuscles" by Geinitz; "On the interference of the bile with gastric indigestion" by Hammarsten; and, "On serum-albumin" by Zahn.

Revue des Cours Scientifiques, February 5.—This number contains an interesting paper read by M. P. I. Van Beneden, of Louvain, at the Belgian Academy of Sciences, on what he terms "commensalism" in the animal kingdom, or certain associations of animals for feeding purposes, which are not, in the ordinary sense, cases of parasitism. The author gives several illustrations of this fact, and he defines the parasite as an animal which lives upon another, while the commensal or messmate is merely a feeding companion. He distinguishes free and fixed commensals. Of the former there are numerous instances in the class Crustacea. The most interesting examples of the latter are the *Tubicinella diadema* or *coronula* covering the skin of whales; the *Remora*, found in the Mediterranean, and made use of, in fishing, by the inhabitants of Mozambique after the manner of a falcon on land. This number also contains a lecture by M. Ch. Robin, on Histology, delivered at the Faculté de Médicine in Paris.

In *Silliman's Journal* for January, Professor B. Silliman has a paper on the relation between the intensity of light produced by the combustion of coal gas and the volume of gas consumed, read at the Salem meeting of the American Association for the Advancement of Science last year, in which he gives as the result of many trials the theorem that, within ordinary limits of consumption, the intensity or illuminating power of gas flames increases as the square of the volume of gas consumed, according to which the method of computation hitherto adopted in photometry, would involve an error amounting to 40 per cent., in the case of rich gas, burning at the rate of 3½ feet an hour with an observed effect of 20 candles—the illuminating power reduced to the standard consumption of 5 cubic feet an hour, being in this case equal to 40 candles instead of 28·57 candles. Hence it follows that all photometric determinations obtained by computation from volumes greater or less than the standard of 5 cubic feet an hour, in the simple ratio of the volumes consumed, must be considered as absolutely worthless. This applies also to the case of sperm candles burnt at a rate different from the standard of 120 grains per hour. As a consequence of these observations it would appear to be essential for photometric observers, in their determinations, to bring the rates of consumption both of gas and sperm to the agreed standards. For the consumer of gas it is evident, also, that where it is important to obtain